TACOMA PUBLIC SCHOOLS

RESTORATION AND ENHANCEMENT PROJECT
REPORT OF PROGRESS
FEBRUARY 4, 1997

The Tacoma School District, in mitigation to the Washington Department of Ecology (DOE) for an oil spill into the Thea Foss Waterway, implemented urban watershed educational programs in various schools throughout the district. These programs were focused within neighborhoods whose stormdrains empty directly into the Thea Foss Waterway, and have provided a wide range of activities to build student and community awareness of human impact on the marine environment.

The basic outline for the project in the mitigation proposal to DOE was that:

1. Students would explore and understand the marine environment of the Thea Foss Waterway and Commencement Bay. They would use maps and photos to understand their place in this urban watershed.
2. Students would work with the Stormwater Utility to analyze runoff samples for contaminants.
3. Students would engage in learning activities regarding the effects of human activities which create pollution in the marine environment.
4. Students would survey their neighborhood for pollution sources and behaviors.
5. Students would develop a community education program on stormdrain pollution.

At the outset an advisory committee of agency representatives from the City of Tacoma Stormwater Utility, the Coast Guard Marine Pollution Program, Citizens for a Healthy Bay, Pierce County Stream Team and the Metropolitan Park District was convened. The purpose of this committee was provide technical guidance to the program proposed to DOE and to support the activities outlined in a grant proposal to the Phillips Petroleum Environmental Partnership program. The committee discussed possible field trip opportunities and what resources were available to provide technical support to the elements of the project.

Originally, two teachers were to be involved in the project; a 6th grade teacher from Jason Lee Middle School and a 7th grade teacher of gifted students at McIlvaigh Middle School. They met with

the advisory committee to lay out a schedule of educational activities and field opportunities for the coming year. However, shortly after the start of the year, the teacher at Jason Lee was assigned to different responsibilities within the school and no other teacher from that building was willing to become involved. The teacher at McIlvaigh was very enthusiastic and took advantage of every opportunity to build a comprehensive watershed program for her class for the rest of the year. She had students for a three hour block during each day so had the flexibility to build an integrated program around the urban watershed topic.

The following explains the program implemented at McIlvaigh as it related to the original program elements:

1. Exploration of the marine components of the Thea Foss Waterway and the boundaries of the urban stormdrain watershed.

Students studied maps and aerial photos of Tacoma so they would become oriented to their relative location within the watershed. The teacher already had a strong background in marine science so she used her materials to teach the students about marine life in the bay.

A field trip through the watershed was planned and executed. The students boarded a bus early in the morning and traveled through various stopping places along their watershed route to the Thea Foss. The first stop was along an open drainage ditch where surface water from the street was deposited. A representative from the Stormwater Utility met the group at the site and explain surface water runoff and stormdrain pollution. The students then travelled to a wetland area where the drainage ditch widened forming a swampy area that is a habitat for many different kinds of wildlife. The wetlands expert from the City of Tacoma met the group and gave them a natural history walking tour of the wetland. The student proceeded next to a restored wetland on the Puyallup River where they met a representative from Citizens for a Healthy Bay who explained the clean-up of the wetland and the work being done to restore natural habitat throughout Commencement Bay. The fourth stop was a lunch break at the new Thea Park at the head of the Thea Foss Waterway and a tour through the Maritime Center where the students learned about the early maritime heritage of the waterway. They saw pictures of old working boats on Commencement Bay and watched craftsmen engaged in restoring some of the old boats that used to work the waterways of Tacoma. The last stop was a beach walk at Owens Beach in Point Defiance Park. They were met by a local native American who told them stories about the

salmon returning to the Puyallup River and the importance of the water to all living things. They chanted songs with him and discussed how they are part of the watershed.

2. Long term measurement and analysis of stormwater runoff.

After discussions with the Stormwater Utility, it became apparent that the middle school students would not be able to sample and test water directly from stormdrains. The steps involved in chemical analysis were more complicated and expensive than the program would allow. Instead a presentation was made to the students in their classroom by technicians from the Utility on how they tested runoff for contaminants.

3. Studies on the effects of oil dumping and runoff on the stormwater system.

A Coast Guard Marine Pollution representative gave a presentation to the class from the "Save Our Seas" curriculum on the effects of many different kinds of pollution on the marine habitat. Activities from "Away with Waste" were provided to the teacher for further implementation in the classroom on hazardous waste disposal in homes and neighborhoods.

4. Neighborhood surveys of oil dumping behaviors.

Students conducted surveys of places where oil dumping might exist in their neighborhood. They walked through several blocks around the school and discussed possible behaviors which might contribute to pollution in the surface water. The students by now were interested in pollution problems and wanted to know how people could stop contaminants from entering the water system.

5. Development of a community education program to prevent further contamination.

The students discussed ways the community might change behavior to prevent pollution. Unfortunately, the class was unable to carry through with a community presentation or development of a brochure, but some unplanned activities followed which allowed this education to take place within the community and school.

Unplanned Activities:

A. **Grant funding and district financial support:** The Tacoma School District set aside $4,500 toward the implementation of the proposed educational program. A $1,700 grant from the Phillips Petroleum Environmental Partnership Awards program was awarded which also helped to implement our urban watershed program.

B. **High school marine science project:** In January a teacher from Mt. Tahoma High School said he had students interested in doing a marine science project on the Thea Foss Waterway and wanted to know if I could help purchase the basic equipment. Funds from the district allocated for the project were available, but I asked that his students in return for the money give a presentation to the students at McIlvaigh on their findings. This was agreed to. The high school students wanted to compare the chemical residues in mussels grown in the Thea Foss Waterway and mussels grown in a nonurban influenced area of Puget Sound. They placed mussels on pilings in January then harvested them in May (see newspaper article attached). A presentation was made to the McIlvaigh students at the end of May on their findings.

C. **Stormdrain stenciling, posters and slide shows:** At the end of the 1996 school year, Citizens for a Healthy Bay wanted to implement a program to educate the citizens within the Thea Foss Watershed about stormdrain pollution and had planned to stencil stormdrains during the summer. We teamed up to implement a program. They had money to hire two high school student interns for the summer to do the stenciling, but needed additional resources to complete their project. Funds from the Phillips grant were still available. Advertisements for summer interns were circulated through the two high schools in the watershed. Two students were selected to participate. The grant monies supported their technical training by sending them to the Natural Resources Youth Camp to strengthen their understanding of natural resource systems and interrelationships. The students also spent several days learning marine science at the Point Defiance Zoo and Aquarium where they shadowed the aquatics staff. They then spent the summer stenciling stormdrains with neighborhood volunteers, teaching people about the effects of surface water pollution on the waterway. These students also gave presentations to a variety of neighborhood meetings throughout the summer. At the end of the summer the interns made seven large posters showing how "The bay begins at your front door". Students from the University of Puget Sound visited seven elementary school to hang the posters in their front halls. Representatives from Citizens for a Healthy Bay and the Tacoma School District created a slide show with puppets doing the narration for presentation at the seven elementary schools during the fall of 1996. Activities on hazardous waste disposal were given to the teachers, and brochures on keeping the watershed healthy were passed out for students to take home.

D. **Neighborhood maps and activities for every elementary school:** Additional funds provided by the school district to support this program have been used to create and laminate 3 foot by 4 foot GIS

maps for each elementary school's neighborhood. The maps detail every building and street within the service area of the school. A notebook of activities for each grade level is in the process of being compiled where the map is the central tool for instruction. These notebooks focus on the effects of runoff on the watershed and bay, and other urban environmental issues including recycling and energy use.

Program Results:

Changing middle school programs: The opportunity to focus attention on the urban watershed has provided a platform for the implementation of many different programs within the school district. We learned that the middle school curriculum is not as flexible as we would have liked to include a comprehensive program of this type, but our attempt has opened discussion within the district about how the overall middle school curriculum might be changed to accommodate more hands-on, real-life experiences for students. The limitations of time schedules (50 minutes periods) does not easily lend itself to field trips by middle school students with the exception of self-contained sixth grade classes.

One classroom to four: The watershed exploration program at McIlvaigh enabled the teacher to design a comprehensive year-round school-within-a-school for the following year (1996-97). She teamed with three other teachers and a group of 94 students from all three grades to combine their school's magnet focus on business with watershed education. The teachers worked all summer to plan an integrated curriculum whereby the students would use their watershed was the basis for building an environmental business enterprise. All the basic academic skills and knowledge have been woven into this program so students are, for example, learning math concepts through mathematical analysis of various watershed elements (stream flow, rain fall, etc). This program is well under way.

Local agency and government cooperation: The cooperation of local agency and utility representatives was a strong component of the success of the program. They provided technical information and good presentations to classrooms which generated informative discussions on surface water pollution. When this program expands to other schools it is unlikely these individuals would be available for more than a few presentation each year, so we will have to find a way to get the same information to classrooms in another way.

Adult knowledge and awareness increased: The enthusiasm of teachers and community groups to learn more about surface water pollution was especially important to the program's success. We found that a positive desire on the part of adults to make behavior changes and to impart their interest to students was valuable. Teachers need more technical education on the effects of pollution, and need incentives to include this information in their academic curriculum.

Community partnerships: The development of community based programs through Citizens for a Healthy Bay helps support our work in the schools. The City of Tacoma is looking for ways to share technical information with teachers and the community about stormwater pollution. These partnerships are of mutual benefit. We are making progress in developing the urban watershed concept using stormdrains as the focus for student learning.

Overall, the project accomplished most of what was planned. While we did not get a comprehensive project in the targeted school, we did build an urban watershed program in another school from one classroom to four. In addition, the puppet/slide show reached over 21 classrooms of students from seven schools with five more schools scheduled for the presentation later this year. Every elementary school will receive a map and notebook of activities on how to use their urban watershed as a learning laboratory which will directly link basic skills and subject matter content with the area around their school.

It is our hope that the waters of the Thea Foss will be a little cleaner as a result of our efforts.

Respectfully submitted:

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